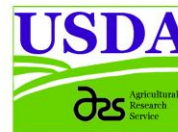




# Activities of the National Arboretum's Floral and Nursery Plant Research Unit

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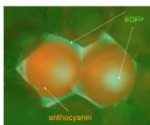


## Projects supported by the FNRI:

### Biotechnology to improve floral and nursery crops

A polyubiquitin promoter from *Gladiolus* (GUBQ1) was isolated and compared with the CaMV 35S promoter in several floral crops. This new promoter could be useful for genetic engineering of disease resistance in *Gladiolus*, rose, and freesia where high levels of gene expression are important in leaves.

Scientist to contact: Kathy Kamo



Understanding factors that affect the expression of anthocyanin genes could be useful in floral and nursery crops to alter flower or leaf color. We developed a system to measure transient anthocyanin expression by cotransformation with the green fluorescent protein (GFP).

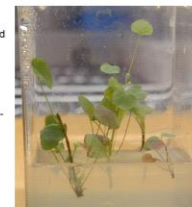
Scientist to contact: Margaret Pooler



### Creating Non-invasive Nursery Crops

In partnership with Tom Ranney (North Carolina State University) and Steve Strauss (Oregon State University), we are developing techniques, methods, and plant germplasm that will lead to sterile or highly infertile cultivars of invasive or potentially invasive nursery crops. The focus in our lab is to use mitotic inhibitors to create tetraploid plants that can then be hybridized with diploids to create sterile triploids. In-vitro methods using *Cercis* (redbud) as a model indicate that exposing shoot tissue to mitotic inhibitors (oryzalin) is more effective than treating callus.

Scientist to contact: Margaret Pooler



### Improved production of Nursery Crops

Studies are underway in McMinnville, TN to improve production efficiency of nursery crops. The emphasis of FNRI funding is on maximizing nutrient and water use and correlating tree growth with nutrient availability.

Scientist to contact: Donna Fare



### Breeding and Genetics of Urban Trees

Germplasm acquisition, evaluation, and taxonomic studies are underway to develop new trees that are disease-, stress-, and pest-tolerant. The focus is on common and underutilized landscape trees suitable for urban areas and height-restricted planting sites, including *Catalpa*, *Chionanthus*, *Nyssa*, and hemlock.

Scientist to contact: Richard Olsen



## Other Projects

### Woody Landscape Plant Germplasm Repository

The National Arboretum is responsible for the curation of the National Plant Germplasm System's Woody Landscape Plant Germplasm Repository. Goals are to expand and improve germplasm collections and associated information for priority woody landscape plant taxa, including selected species of *Stewartia*, *Cornus*, *Magnolia*, *Celastrus*, *Hamamelis*, *Cotinus*, *Cladistria*, *Ostrya*, *Carpinus*, *Clethra*, *Hydrangea*, *Cercis*, *Celtis*, and *Viburnum*.

Scientists to contact: Richard Olsen, Kevin Conrad, Mark Roh



### Turf Research

This research program focuses on identifying, characterizing, and developing grass germplasm suitable for turf uses. Emphasis is on investigating heat tolerance and disease resistance by using molecular markers and linkage maps in bentgrass, and on cooperative work on low-maintenance species such as *Koeleria macrantha* and *Danthonia spicata*.

Scientist to contact: Scott Warnke



### Taxonomy of cultivated plants

The objectives of this research are to identify and characterize genetic resources of primarily woody landscape plants; to maintain and enhance the National Arboretum herbarium and the seed herbarium as scientific resources and documented collections; and to investigate the characteristics of selected invasive woody plants in the U.S. Genera currently under investigation include *Ulmus*, *Celtis*, *Quercus*, *Catalpa*, and *Chionanthus*.

Scientists to contact: Alan Whittemore and Joe Kirkbride



### Ornamental Tree and Shrub Breeding

Ongoing projects in McMinnville, TN and Washington, DC focus on developing new landscape trees and shrubs that are disease and pest resistant, are tolerant of environmental stresses, and have superior ornamental value. Breeding methodologies include wide hybridizations, ploidy manipulations, and the use of molecular markers to evaluate progeny and germplasm. Genera include *Cercis*, *Clethra*, *Hydrangea*, *Lagerstroemia*, *Prunus*, and *Sytra*.

Scientists to contact: Sandy Reed and Margaret Pooler

